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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,519	06/15/2006	Jean-Francois Bonfanti	TIP-0052SPCT	7522

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PHILIP S. JOHNSON
JOHNSON & JOHNSON
ONE JOHNSON & JOHNSON PLAZA
NEW BRUNSWICK, NJ 08933-7003

EXAMINER	
CHANDRAKUMAR, NIZAL S	
ART UNIT	**PAPER NUMBER**
1625	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,519	BONFANTI ET AL.	
	Examiner	Art Unit	
	Nizal S. Chandrakumar	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *17-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This application filed 06/15/2006 is a 371 of PCT/EP04/53606 12/20/2004 which claims benefit of 60/566,835 04/30/2004.

Election/Restrictions

Applicant's election with traverse of Group I in the reply filed on 03.26.2007 is acknowledged. The traversal is on the ground(s) that PCT found unity of invention. This is not found persuasive because the holding of unity or lack of unity of invention by the international authority is not binding at the US national stage. If at the US national stage a lack of unity can be supported, then lack of unity can be imposed.

The requirement is still deemed proper and is therefore made FINAL.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a few variables of the formula (I), does not

reasonably provide enablement for general class of compounds claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and or use the invention commensurate in scope with these claims. The core benzimidazole structure has numerous attachments that make the species so diverse, making the scope of the claims extremely broad, encompassing an extremely large number of compounds. For instance, the Examples described in the specification are very narrow and limited to pyridine derivatives (R_1) and methylene spacer G. The specification does not disclose any examples of prodrugs, N-oxide, addition salt, quaternary amine, metal complex of formula (I). As such, the disclosure of the instant specification is not sufficient to support the general formula of (I).

Enablement is considered in view of the Wands factors (MPEP 2164.01 (a)). These include: breadth of the claims; nature of the invention; state of the prior art; amount of direction provided by the inventor; the level of predictability in the art; the existence of working examples; quantity of experimentation needed to make or use the invention based on the content of the disclosure; and relative skill in the art. All of the factors have been considered with regard to the claim, with the most relevant factors discussed below:

The breadth of the claims: There are 9 variables in the claimed formula (I), Q, t, R5, G, R1, R1b, R3a, R2a, R2b. Each variable has numerous additional possibilities. For example, Q is defined as

Q is C_{1-6}alkyl optionally substituted with one or more substituents each independently selected from the group consisting of trifluoromethyl, C_{3-7}cycloalkyl, Ar^2, hydroxy, C_{1-4}alkoxy, C_{1-4}alkylthio, Ar^2-oxy-, Ar^2-thio-, $Ar^2(CH_2)_n$oxy, $Ar^2(CH_2)_n$thio, hydroxycarbonyl, aminocarbonyl, C_{1-4}alkylcarbonyl, Ar^2carbonyl, C_{1-4}alkoxycarbonyl, $Ar^2(CH_2)_n$carbonyl, aminocarbonyloxy, C_{1-4}alkylcarbonyl-oxy, Ar^2carbonyloxy, $Ar^2(CH_2)_n$carbonyloxy, C_{1-4}alkoxycarbonyl$(CH_2)_n$oxy, mono- or di(C_{1-4}alkyl)aminocarbonyl, mono- or di(C_{1-4}alkyl)aminocarbonyloxy, aminosulfonyl, mono- or di(C_{1-4}alkyl)aminosulfonyl or a heterocycle selected from the group consisting of pyrrolidinyl, pyrrolyl, dihydropyrrolyl, imidazolyl, triazolyl, piperidinyl, homopiperidinyl, piperazinyl, pyridyl and tetrahydro-pyridyl, wherein each of said heterocycle may optionally be substituted with oxo or C_{1-6}alkyl; or Q is C_{1-6}alkyl substituted with two substituents wherein one substituent is selected from the group consisting of amino, mono- and diC_{1-4}alkyl-amino and Ar^2-C_{1-4}alkylamino and the other substituent is selected from the group consisting of carboxyl, C_{1-6}alkyloxycarbonyl, Ar^2-C_{1-4}alkyloxycarbonyl, aminocarbonyl and aminosulfonyl;

As such, the claims are very broad and encompass a large variety of compounds.

The nature of the invention: The nature of the invention is a large markush of compounds that are inhibitors of virus replication.

The existence and absence of working examples: There are Examples for preparing compounds of the formula (I) limited to one single variant of G (methylene), one single variant of R1 (pyridyl), one variant for t (2) and one variant for R5. The specification does not disclose any examples prodrugs, N-oxide, addition salt, quaternary amine, metal complex of formula (I). The source for procuring the starting materials (commercial or literature citation) is not disclosed in the specification. There are no examples wherein R1 is other than pyridyl, while the claims define R1 as encompassing a wide variety of heterocylces. The application recites, G as a bond or C1-10 alkanediyl optionally substituted with wide variety of functionalities, while the

disclosure is limited to G = $-CH_2-$. R5 is defined as hydrogen or C1-6 alkyl, while the disclosure is limited to R5 = H.

The quantity of experimentation needed to make or use the invention: The quantity of experimentation needed is undue. One skilled in the art would be faced with burdensome research in developing strategies with regards to starting materials, reagents or process conditions needed for making the claimed inventions. The protocol disclosed for the reaction of 2-chlormethylpyridine derivative would not work with 2-(5-chloropentyl)pyridine, because the leaving group in this case is not activated as in the case of benzylic-type 2-chloromethylpyridine. In general, the direction provided with the Examples is not applicable for variables claimed with the generic formula (I). The disclosure in the specification would not enable the preparation of the functionalized heterocyclic derivatives claimed.

The level of skill in the art: The level of skill in the art is high.

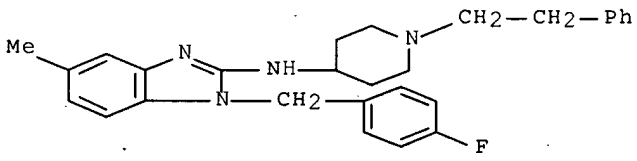
Therefore, in view of the Wands factors discussed above, to practice the claimed invention herein, one of ordinary skill in the art would have to engage in undue experimentation to test which method can be used to prepare the compounds, with no assurance of success. It is not seen where the instant specification teaches how to make compounds of formula (I) with variables other than the following, G = $-CH_2-$, R_5 = H, and R_1 aryl and pyridyl.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 5-7, 10-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Janssens et al. (Journal of Medicinal Chemistry (1985), 28(12), 1934-43) page 1939, Example 87,



RN 75970-78-4 CAPLUS

corresponding to formula (1) of claim 1 wherein

Q is C1-6 alkyl (ethyl) substituted with Ar2 (phenyl)

t is 2,

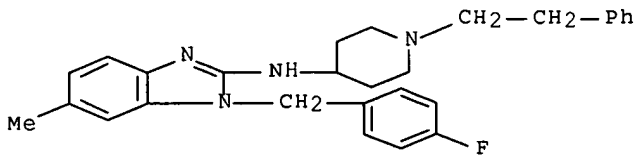
R5 is Hydrogen,

G is C1-10 alkanediyl (methylene)

R1 is Ar1 (phenyl substituted with halo)

R2a is C1-6 alkyl (methyl) R3a is hydrogen, R2b is hydrogen and R3b is hydrogen

Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Janssens et al. (Journal of Medicinal Chemistry (1985), 28(12), 1934-43) page 1939, Example 87,



RN 75970-79-5

corresponding to formula (1) of claim 1 wherein

Q is C1-6 alkyl (ethyl) substituted with Ar2 (phenyl)

t is 2,

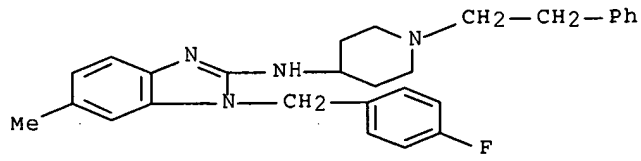
R5 is Hydrogen,

G is C1-10 alkanediyl (methylene)

R1 is Ar1 (phenyl substituted with halo)

R 3a is alkyl, R2a is hydrogen, R2b is hydrogen and R3b is hydrogen

Claim 10, 11, 12, are rejected under 35 U.S.C. 102(b) as being anticipated by Janssens et al. (Journal of Medicinal Chemistry (1985), 28(12), 1934-43) page 1939, Example 87,



RN 75970-79-5

corresponding to formula (1) of claim 1 wherein

Q is C1-6 alkyl (ethyl) substituted with Ar2 (phenyl)

t is 2,

R5 is Hydrogen,

G is C1-10 alkanediyl (methylene)

R1 is Ar1 (phenyl substituted with halo)

R2a is C1-6 alkyl (methyl) R3a is hydrogen, R2b is hydrogen and R3b is hydrogen.

Allowable Subject Matter

Claims 4, 8 and 9 would be allowable if rewritten to overcome the rejection(s) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:
The closest prior art (WO 01/00611 A1) does not teach the variable Q present in the allowable claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nizal S. Chandrakumar whose telephone number is 571-272-6202. The examiner can normally be reached on 8.30 am – 5 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas McKenzie can be reached at 571-272-0670 or Primary Examiner D. Margaret Seaman can be reached at 571-272-0694. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nizal S. Chandrakumar

D. MARGARET SEAMAN
PRIMARY EXAMINER